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BUSHCRAFT USA

Magazine

*Learning Multiple
Use Plants*

ALTERNATIVE TO
FLINT AND STEEL

A Guide to Winter
Clothing

Bushcraft
Checklist

Knot Review

Prusik and Canadian Jam

Heat Loss

Cause and Prevention

Childhood Bushcraft

Real Winter Camping

Bushcraft On The Go

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The Digging Stick: *Can you dig it?* by Kevin Estela

Background

The development and use of hand tools marks a turning point in the history of man. I'm not referring to the latest and greatest power tool, but primitive technology. Amazingly, many cultures left isolated from the industrial revolution continued to use wooden tools until converging patterns of trade and exploration made the world smaller. Even more amazing, there are presently some indigenous cultures living the old way and using only what mother nature provides. Then of course, there are the bushcraft and survival practitioners like you and me who "dig" the primitive technology and wish to keep it alive.



Construction:

Digging sticks are best made from green hardwood. Osage Orange, Hop Hornbeam, Oak, Beech and Plum are just a few of the proven woods for tool making. To start, you should look for a section of tree, straight if possible but not necessary, about 2 to 3 feet in length. I prefer the longer style as I don't want to bend down as far when I use it. Make sure your section is anywhere from 1.5" to 3" wide. There is no exact width necessary and everyone will have a personal preference to what size stick they use. Just remember, the tool will be heavier the longer and wider it is. After your section is cut, you need to

make the wider end the digging end. You will have to taper the end starting about 9" to 12" back from the tip. Do not simply make a shallow taper as this will make digging harder. You want as little material in the way to create drag as you dig deeper. Don't remove all the bark as this will provide grip. I prefer making my tip in the center of the wood near the heart wood. You can also make it a wedge shape tapering from one side to the other. Try to make the carved section as smooth as possible and keep it a consistent thickness. Once you have carved your wooden tool to your liking, you need to fire-harden it for best results. This process rapidly removes moisture from the wood using heat. To do this, you need to insert the digging portion of your stick into the ashes of your fire (please read ashes, not coals!) The ashes will be very hot but there will be no oxygen within. Without oxygen your wooden digging stick will not burn. Genius right? For this article's digging stick, I left mine in the ashes for 30 minutes. The length of time you leave it in for will vary.



Use:

The beauty of the digging stick is how well it works, considering what it is. Sure, I occasionally slowly probe (going against many

suggestions) with my knife in rich soil for various edible plant roots. I would never do this in anything rocky or sandy as it could potentially damage my most important tool. With the digging stick, I don't have to worry as I can always carve another. To use it, you can either probe slowly around the intended plant root for harvesting or jab it aggressively in the ground like a shovel. Keep in mind, it is a wooden tool and it will not take the same aggressive prying motions as its steel counterparts. It will also wear quickly if used in rocky soil. The benefit of this type of tool comes in the deep but small diameter holes it can make. It leaves a minimal trace and doesn't disrupt the soil as much as a wide shovel. On a recent course, one student of mine found a section of tree with a crook forming a natural foot rest. He used it effectively to gather Indian Cucumber and wild leeks. Ultimately, you can modify your tool to your personal style. If you can't carry a small spade, trowel or shovel, you will have the knowhow to make a digging tool when you need it. Good luck and happy foraging!

Kevin Estela
Survival Instructor
[Wilderness Learning Center](#)



Alternative to Flint and Steel

by Jeff Wagner (Flintlock)

Of all the fire starting methods discovered over the millennia, none are more remarkable than the Fire Piston. Patented in Europe in 1801, this palm-sized device, constructed completely from natural materials, is capable of instantly creating a burning ember with a single push of the piston. It utilizes natural tinders that can be collected in the woods and fields without special preparation and unlike other primitive fire starting methods, the fire piston performs well in a wet environment because the live coal is created by compressed air.... Incredible!

Many buck skinners, re-enactors and living history buffs as well as modern survival enthusiasts are familiar with primitive fire starting techniques. These methods include the bow drill, hand drill, flint and steel and burning lens. However, most are also completely unaware of the existence of the Fire Piston, an amazing device that enjoyed a brief period of popularity in England around the year 1800, about the same time as the development of the phosphorous match.



The Fire Piston represents a remarkable combination of primitive yet sophisticated technology. Similar to the modern diesel engine, its operating principle is compression. In fact, there is speculation among scholars that the inspiration leading Rudolf Diesel to invent his engine in

the late 1800's may have actually come from witnessing a fire piston demonstration. When molecules of air are forcefully compressed, they become hot. As the shaft of the fire piston is thrust into the cylinder, the air inside is compressed and raised to a temperature in excess of 800 degrees Fahrenheit in a brief burst of energy. A single push of the piston with the hand is all that is required to instantaneously ignite the tinder.



A traditional fire piston consists of a wood, horn or brass cylinder approximately 4 to 5 inches long and a precisely fitted piston. To achieve the necessary compression, the piston must create an airtight seal, yet be able to move freely within the cylinder. To accomplish this, the piston is wrapped a short distance with string or leather to create a gasket. Grease is applied to the gasket for lubrication and to aid in creating the seal.

In construction, great care must be exercised to assure the bore is concentric and free of imperfections. Minor dimensional variations in either the bore or piston can result in loss of compression preventing the

piston from generating the necessary heat. While difficult and tedious to fabricate, fire pistons represent a durable and effective fire-starting device able to create innumerable lights. When a piston eventually becomes worn from repeated use, original performance can be restored in minutes by simply re-wrapping the gasket.

Fire pistons can be used to ignite a variety of natural tinder, plus the same cotton charcloth so familiar to flint and steel users. Some of the more useful and common of the natural tinders for the fire piston include milkweed pod ovum (the puffy structure remaining inside the pod after the fluff has been dispersed), milkweed down, poplar cotton, the pith of the mullein stalk and cattail fluff. In a hardwood forest environment, decayed wood punk, collected from dead standing trees, represents a very useful and abundant wild tinder. Wood punk lights very easily in the fire piston, catches a spark from flint and steel without charring and can be blown into flame in place of a fiber nest. However, the best of the natural tinders is actually a fungus. True Tinder Fungus or *Inonotus obliquus* is parasitic growth common to birch trees and may develop at the site of an injury to the tree such as a broken limb. This fungus has a blackened, charred looking exterior with an interior the color of buckskin and consistency of cork. The interior of this fungus makes remarkable tinder that is difficult to extinguish once ignited. In addition to use in fire pistons, tinder fungus will also catch a spark from flint and steel without special treatment and it makes an excellent hearth board for hand drill and bow drill fire making.

To create a fire using a fire piston, a small amount of tinder is placed in a cavity carved into the end of the piston. The piston is inserted a short distance into the cylinder. The cylinder is gasped firmly and the piston given a quick push or sharp blow with the palm. The piston is immediately withdrawn to reveal a smoldering ember in its tip. The ember is placed into a bundle of shredded bark or punk wood and blown into flame. With a small amount of practice, the entire sequence can be performed in well under 30 seconds.



A glowing ember is more lasting than an isolated flame, and unlike a flame, it is made stronger by moving air. When an ember is placed in tinder such as the shredded inner bark of certain trees, fungus, or punk wood, it expands rapidly, increases in temperature and bursts into open flame with a few breaths. This coal initiated fire making process is precisely how fire was made for thousands of years prior to the development of matches and instant flame technology.

The fire piston represents a unique, effective and period-correct fire making tool worthy of inclusion in any possible bag. With just a little practice, your next rendezvous campfire can be ignited in only a few seconds and everyone who sees the fire piston in use will be completely amazed.



Jeff Wagner
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KNOT REVIEW

by Skab0311

PRUSIK

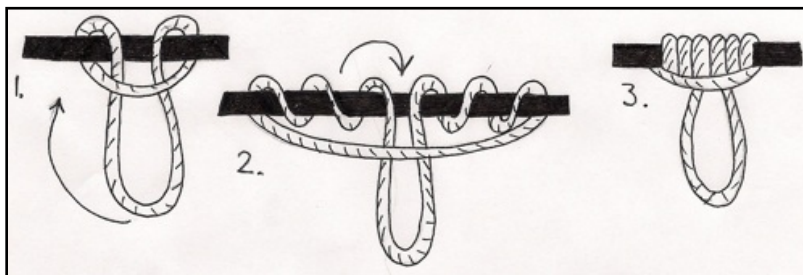
A Prusik is a friction hitch or knot used to put a moveable loop of cord around a fixed rope, applied in climbing, safety lanyards, rope rescues, and by bushcrafters. The term Prusik is a name for both the loops of cord and the hitch.

The Prusik hitch is named for its inventor, Austrian mountaineer Dr. Karl Prusik. It was shown in a 1931 Austrian mountaineering manual for rope ascending. It was used on

several mountaineering routes of the era to ascend the final summit peak, where a rope could be thrown over the top and anchored so that climbers could attain the summit by prusiking up the other side of the rope. The benefit of the knot is that when weighted, it grips the rope that it is tied around. When the weight or tension is removed, it is free to slide. This enables it to be used in a number

of self-rescue situations as well as other bushcraft scenarios.

In bushcraft and, camping the knot is mainly used for setting up shelters. When using it for a tarp shelter it not only allows you to secure the tarp to the ridge line but also allows easy tensioning of the tarp.



CANADIAN JAM

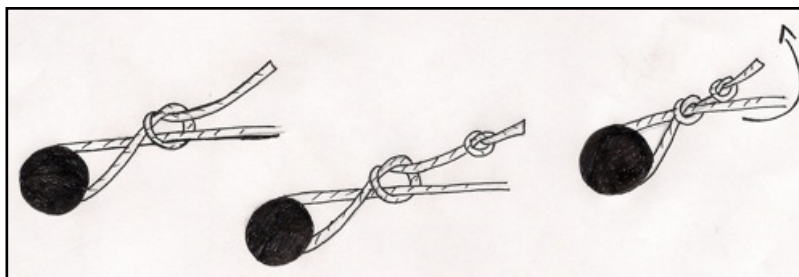
I present to you the Canadian Jam Knot (aka the arbor knot) made famous by our very own Terry Barney but first described by Mors Kochanski in one of his booklets, "Top Seven Bush Knots and the Use of the Windlass." It is fast becoming one of my go to knots for bushcraft use.

It can be used to lash your bed roll to your pack, put up poles for your tarp, bind snowshoes, compress your sleeping bag and even used to attach fishing line to your reel. And the great part is this knot is easy to learn, if you can tie your shoes you can tie this knot.

All you need to know is the simple overhand knot. Tie one at the end, leaving a "tag" to pull on later. Be prepared to lose that knot and the little bit after it if you use the Jam knot hard on something. Next, tie a second overhand knot a ways down from the other and run the end of the cord back through. Pull on the end of the cordage that has no knots and "jam" the other two knots together. To loosen,

simply pull the tag you left hanging out after the first overhand knot.

Instructions and illustrations by Skab0311



Bushcraft On The Go

By Marc Hallee



Bushcraft can be practiced anywhere, everywhere and just about all the time. The key to enhancing your skills is to keep applying them to everyday life, wherever your travels may take you. Most of us probably relate Bushcraft and/or Woodlore to being out in the wilderness, sitting by a campfire while a small tin hangs from a tripod heating up some pine needle tea. Yes, that does sound like a great time, but Bushcraft can mean so much more than that.

To really apply the Bushcraft mindset, you need to be thinking about your resources every moment you can. Keep a sharp eye for something that can be used for when we do actually make the time for that campfire retreat. Look for items all around you every day and try to think of a Bushcraft type use for it. Just keep an open mind and open your eyes to a whole new world.

Let's create a few scenarios to help illustrate and put it into a better perspective. Say you're a city dweller like me and you can't make it out to the forest today because time just won't allow it. So after work, you decide to take the family to the local park, which is about a ¼ acre in size. There's a nice statue, a couple of huge oak trees, and a bench to rest your tired feet at. As the kids are playing, watch how the squirrels and chipmunks act. This time of year, the squirrels are starting to gather acorns from the oak tree and

burying them for winter storage. Which limbs do they use most frequently? Which tree do you think they are living in? Do they have a route that they prefer over another? What obstacles do they seem to avoid and which ones do they ignore? By answering as many questions as you can, you have just put your mind on a task that will provide valuable information the next time you are out trapping squirrels as your next meal. Not that you'll be at the local park trapping squirrels, but gaining knowledge on animal behavior is extremely valuable when you really need to find a food source. And while you're at it, talk to your kids about the behavior and have them answer the same questions. You'll be amazed at what they actually pick up for details and the things that you missed. It's just as important to pass the Bushcraft skill on as it is to apply it.

As you can see, bushcraft on the go is just a matter of putting your mind to it. But before you even get to the park, take it back one step. As you're strolling down the sidewalk and avoiding the dangers of modern man, you can test your plant skills. Is that an edible plantain weed coming through the cracks? Is that a sugar maple tree in that guy's yard? Is this a red or white oak and how do you know? Have you ever noticed just how much Queen Anne's Lace was actually growing next to that shrub?

They say that one man's trash is another man's treasure. You can use this old soda bottle to collect some pine sap or tar when you get to the park. Will this quartz stone give a spark? I could go on all day of the possibilities of trying to find a use for every little piece of trash, but I'll leave that up to you. The options

are endless. And try to include your children; make it like a game for them. Explain the differences and have them explain it back to you. Then quiz them as you walk down the street. Teach them to be observant and have the Bushcraft mindset.



Using your skills and knowledge can help keep you sane when you can't make it out to your bushcraft playground. So start training yourself to have that bushcraft on the go mentality and open your eyes to what's around you. And the next time you go for a stroll to the local park, by all means try not to step in that big pile of dog poop. For a real test, ask yourself what can you actually use that dog poop for? Till next time, always remember... Bushcraft is everywhere and anywhere.

Marc is a New Hampshire native who's a passionate Bushcrafter practicing his traditional arts in a modern world.

<http://www.youtube.com/user/LowBudgetBushcraft>

Learning Multiple Use Plants

By Terry Barney

Several months ago, I authored a thread on what skills most people would like to learn at a bushcraft school and received a lot of good input. The one subject that people really wanted to learn was plant ID and uses. I found this a little surprising since this is a subject that can get you into trouble due to the poisonous nature of certain plants. So, before we go any further make sure that the plant you are going to eat or use is what you think it is. If you are unsure, please leave it alone.

In my area, I have tried to learn plants that have more than one use. What uses am I talking about? For me, edibility, cordage, firecraft, and workability are the traits I am looking for. In my opinion, if you can learn just a few plants that have these characteristics, you are way ahead of the curve. The trees and plants I use the most are fairly common in most areas. The key is learning the species in your area that will meet your needs. Here are a few of my favorites.

Cottonwood

These trees are found in almost every area I frequent. It is very easy to identify and has many great uses. It is not really edible, but the buds can be used to make Balm of Gilead. The bark on the larger trees makes a near frictionless bearing block. It also makes some great looking spoons. After you are done carving your

spoon, you can use the shavings to start your fire. Speaking of fire, the Cottonwood is a great wood for your bow and drill set. All in all, a great tree to learn.



Cattail

Another staple of many woodsmen is the cattail. Almost every part of this plant is tasty! The roots are a great starch, the young shoots taste a lot like cucumber, and the heads can be eaten like corn on the cob in the spring. The leaves can be twisted into cordage or used to make insulation beds. When the heads go to seed, the fluff makes for a great flash tinder and coal extender. If you cut the stalk green and let it dry, it is a great spindle for the hand drill.



Basswood

This has to be one of my favorite trees. The large leaves

are not only edible, but they make great platters for the prepping of food. The dry wood is some of the best in my area to use when making the bow and drill. It carves very easily, making it a prime wood to make utensils. The inner bark can be twisted into a thick cord and charred in a sealed tin. The charred rope catches a spark very quickly. Probably one of the quickest cordages in the Midwest is the bark of the basswood. I have several of these trees on my property so I have the ability to strip the bark off of low branches or small saplings. I have used this quick "rope" for many projects from shelter lashings to a makeshift sling for my marlin.



These are only a few of the multiple use plants in my area. I would encourage you to get out and learn a few in your own backyard.

Terry Barney is a former Air Force Survival Instructor (now referred to as SERE Specialist) and owner of the Midwest School of Bushcraft.
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Heat Loss: Cause And Prevention

By GreyOne

In colder weather, we all know that it is easy to get chilled, and this can have serious consequences, from Hypothermia to Frostbite. What most people never think about are the causes of heat loss: the actual physical mechanisms that steal our body heat, and leave us colder than we were. There are five major heat loss mechanisms, and I want to discuss each of them briefly, and point out things that help to defeat each one, and keep us warmer.

Respiration

The first cause, respiration, is also the one we can do the least about under normal circumstances.

We all have to breathe, and with every breath, warm air from our lungs is exhaled, taking body heat with it. Then cold air is inhaled, and body heat is used to warm it up as we inhale it.

By avoiding overexertion, and panting, we can at least control the heat loss to some extent. A scarf or other wrap loosely covering the nostrils can also help, by holding some of the warmer exhaled air close, to mix with the new and colder air we inhale.

Conduction

Conduction is heat loss by contact with a colder surface. Pick up a cold metal pole, or set on a cold rock for a minute, and you can feel the heat being conducted away from your body. Sleeping on the cold ground is another major example of conductive heat loss.

Insulation is the answer here- gloves on head, a ground pad or

browse bed to sleep off the ground, using a coat or pad to set on, etc. This is one form of heat loss we can usually do a lot to control.

Convection

This is heat loss from air currents carrying away warmer air and causing the body to work harder to maintain its surface temperature.

The solution is to use windproof clothing, or a shelter that breaks the wind. The well known "Wind Chill" factor is what we are trying to defeat, and simply staying out of the wind can make a 20°F to 40°F difference in the chill factor, depending on actual temperatures.

Evaporation

This is the heat lost from moisture (sweat) evaporating from your body or clothing. In hot weather this is a blessing, but in the cold, it is deadly. It matters little whether you get wet from rain, falling in the river, or sweating from overexertion, the effect is the same: a potentially deadly heat loss.

To prevent this, the answer is to stay dry, or get dry if already wet. This is why in cold weather you need to keep your physical exertion under control, so you do not start to sweat. This relates to the answer for the Respiration factor above, so pay attention, you get two problems controlled with one simple step. Don't over exert!

Radiation

Our skin is supplied with a large number of blood vessels, and has a lot of surface area. Every square

inch radiates heat into the air. This loss of body heat is especially great for the head, hands and feet, and the groin and armpit areas.

To control this radiation heat loss, cover your hands, and head, and wear proper clothing to keep heat close to your body. Most of my generation grew up hearing "If your feet are cold, wear a hat". Radiation heat loss is why.

The total answer to heat loss is good clothing that insulates, keeps us dry and gives wind protection. It is also important to cover vulnerable areas and maintain awareness of physical exertion to keep respiration and perspiration (evaporation) under control.

There is another side to some of these factors, and that is how we can use them to gain warmth.

When we build a fire, we can gain heat from it by both convection and radiation. The control of warm air currents can help a lot, and a reflector behind a fire will dramatically increase the heat thrown into a shelter. Warm stones or water bottles can give us conductive heat for the night as well. A tent or tarp that blocks rain and wind helps to limit evaporative and convective heat loss, as well as radiative heat loss.

Stay dry, stay warm, and have fun out there.

THE BUSHCRAFT CHECKLIST

By Iz Turley

Never heard of the bushcraft checklist? That's because it's not really a tangible thing. There's nothing of it written down anywhere; you can't send off to Ray Mears and get one to hang on your wall or stick in your pack, but it does exist. You've probably seen evidence of it and may unknowingly use it yourself at times. It usually goes something like this:

1. Learn to build a fire. 2. Learn the chest lever knife grip, the hammer grip, the reverse super high energy chest grip and all other conceivable knife grips 3. Learn the bow and drill friction fire method 4. Learn the bow and drill using natural cordage. And on and on up the mythical bushcraft skills ladder.

It's the unwritten list that some feel they have to follow in order to be taken seriously, to be respected. You can see this phenomenon displayed in internet posts and youtube videos at times. It's subtle but it's there. Every skill that is learned is posted up in still or moving pictures for posterity's sake and then checked off the list. Once all the skills on the list are learned (not necessarily mastered), then the person feels like they have

arrived at some peak that has eluded them until this point. They're at the top of the skills and knowledge ladder in the bushcraft community and now all is well, they will be looked at with respect. All of this usually happens without the individual even knowing it.

In my opinion that list is worthless. Plain and simple, a waste of time and energy. Not the skills themselves, but the perceived or real peer pressure that created the list in the first place. Everyone wants to measure up and be accepted in their chosen hobby or profession, and bushcraft is no exception. I don't look down on anyone who is on the journey of checking off all the skills on the bushcraft list. I do feel bad for them though. I feel bad that they might be missing the entire point of it all. Missing what probably brought them to these skills in the first place; the woods and the love of being there. I'm afraid that they are concentrating so hard on completing the list that they're missing the trees and the forest all in one smooth pass, and that's a tragedy.

I'm not a list teetotaler by any means myself; I don't want you to come away thinking that. I have my own list and it goes something like this:

1. Go to the woods
2. Have fun

That's about it. Any skill I practice is for fun or what I consider a requirement for myself because of the area I live in. Not because it's on the accepted, official bushcraft list. And when I practice those skills, I have fun. I won't practice something that does me no good or

that I see as unnecessary for having a good time or for survival in the woods. Here's an example: The hand drill would be a skill that is high on the bushcraft list but near the bottom of mine. Why, you ask? First of all because I'm lazy and the hand drill method looks like too much work and secondly, because I always have cordage or can make cordage for the bow and drill method. Yeah, yeah, I know there's always a chance I'll get dropped buck naked (nobody wants to see that) into a wilderness that has no cordage plants whatsoever, but that's a risk I'm willing to take.

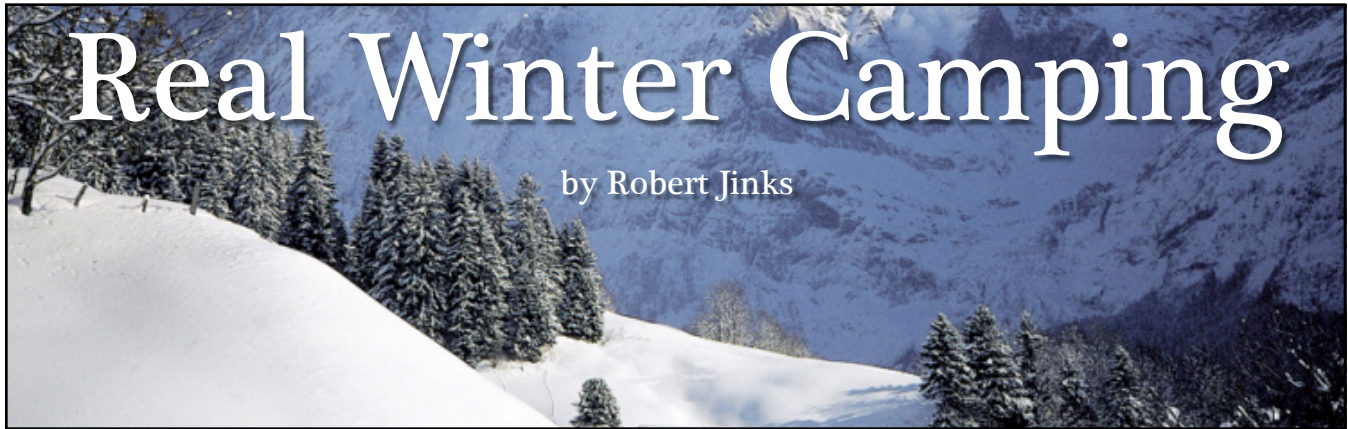
I guess what I'm saying is this: don't let your lack of mastery of the bushcraft list keep you from feeling valuable to the bushcraft community. Don't let that feeling of not knowing the proper reverse lever, back fist, super duper knife grip make you learn something that is useless to you and worst of all, not fun. Don't do it for acceptance. Do it for the love of doing it.

Now it could so happen that you feel that every skill on the bushcraft list is truly essential and fun; if that's the case then proceed as planned. Forget all my blithering because it doesn't apply to you.

On the opposite side of the coin, if your ego is so big that your head can't fit through the door because you've checked off all the skills on the list then I'm glad. I don't want you coming through my door anyway.

Iz Turley is the owner of Turley Custom Knives

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Real Winter Camping

by Robert Jinks

My father had a childhood friend that lived in Harbor Springs, Michigan whom we would visit in the summers when I was young. His name was Denny, and he was a sheriff's deputy. Summer would mean he was on the Harbor, and winter would find him on a snowmobile as part of the sled patrol. Every time we took vacation to travel north in the summer, we would stop to visit and he would have stories about what I think of as "real" winter camping. This meant sleeping in a shelter built from locally gathered materials and practicing survival skills during the day.

Before I was able to drive, I had wanted to go on one of his outings. This is not surprising since Denny is one of those types that could get people excited to do just about anything. I would wait for about ten years before I would finally get my chance to get out there with him and learn from a guy that had been doing

this every year for the past twenty-five years. I brought along a camping buddy of mine that I knew would share the same enthusiasm as myself about freezing our butts off sitting in the woods.

Denny sent us out a letter detailing the equipment that was suggested to help keep us comfortable and safe during the weekend. This would be a simulated survival situation, so we were allowed to bring our own gear, and then we would gradually learn how to live without it as the nights passed. The drive up there was the usual "we can't wait to finally be up there and in the woods" kind of drive. We knew from talking to Denny that there was over three feet of snow on the ground. In fact, that year was so cold, waves were freezing to create glacier type ice formations. This was a good indication that we would be in for a really cold weekend! We met Denny at a gas station in Harbor Springs and we were off to the woods.

We followed Denny down a country road in the woods and pulled up to a spot that he had found while on patrol on his snowmobile. This was a trail that wasn't frequented by sleds in the area, so it would be a great trail head to start our hike, and we could also leave the vehicles there. We packed our gear in sleds that Denny had brought with him. This was a great choice because as we would find out, learning how to use snow shoes with a full pack on is very difficult! So we packed everything in the sleds and pulled them behind us as we walked in our snowshoes for two miles to our destination. Once we got to our camp site, we walked around for a while to pack down the snow so that it would support our weight, making it so we would no longer need the snow shoes.

At this point, it was time to build what Denny called an Alaskan A-Frame. This type of shelter is also called a Thermal Shelter or Thermal A-Frame. This is where you dig into the snow until you hit the ground, find two branches with a fork at the top to create the front of the shelter and then you get a longer, third branch to create the body of the shelter. You lash the three together to make sure it keeps its shape. This is exactly like a debris shelter, but digging the snow out to uncover the ground is important. You finish this off with putting ribs on and weaving in pine boughs to create the roof. To this, you add enough pine boughs to the floor to create a six inch barrier between you and the ground. Snow would be piled on top of the shelter for insulation, and a "door" would be fashioned from pine boughs that you would be able to pull in to close off the shelter. The idea behind this shelter is that the ground will be kept at a constant temperature from the blanket of snow. The triangle shape also lets heat be reflected back towards you. Another tip about this shelter is that you don't want to make it super high. Keeping the ceiling low will keep heat closer to you since heat will rise. If done correctly, this shelter will stay at or around 45 degrees. This shelter does not require a fire near the opening. The occupants body heat, combined with the insulating effect of the snow, maintains the temperature.

After we created our shelters, we set out to start a fire. We gathered wood from around the area while Denny dug out a

pit in the snow. A channel was dug so that the wind would blow through it to help keep the fire fueled with oxygen. We were in a frozen swamp, so fallen wood was plentiful. We all had axes, and we all worked at gathering wood to keep our fire going for most of the weekend. We were not to use any lighters, only sparking devices to start our fires. Our first one was started with a magnesium match and with proper tinder, we had a small fire going in no time. As the weekend progressed, we went from putting small branches in the fire to using larger wood in order to conserve energy. This meant our tiny fire that has been lit the first day grew to a ring in the snow about six feet in diameter.



After this, we learned about keeping water from freezing during the cold nights. I explained this before in a post on the forums. Denny didn't tell us

ahead of time how we were going to do this, but insisted he would teach us. It drove me crazy trying to think of how this trick would be done. In the end, it was more basic than I would have guessed. Again, the ground under the snow would come into play. The trick was to dig a hole in the snow, line the sides with pine boughs, and then cover it all with snow after placing the water inside. I was skeptical about this, but it was my first time and Denny's twenty-fifth year at this, so I decided to go with what he said. This trick is not needed for survival, but it is nice to keep a large amount of drinkable water accessible without having to melt it again. This is good for times when you won't have a fire the next day.

We went over venting techniques for when we were working hard so we didn't sweat as badly. This is when you use convection and evaporation by leaving the top of your coat open while hiking or doing harder jobs like cutting wood. This prevents sweat from building up under your layers, keeping you warmer when you are not moving. Closing everything up when you sit down to take a break is important. While sitting by the fire, drying your socks and "felts" from pack boots is important as well. Keeping dry is a key to surviving in sub zero temperatures! This goes double for your feet! Drying things off while in front of the fire will make your night ten times more comfortable, believe me.

Before we went to bed, Denny described how we could use our legs to “bicycle” to generate heat once in the shelter. This is better than doing jumping jacks outside of the shelter because the heat generated stays inside and is not wasted. This is another conservation lesson. Remember, in a real survival situation, having little or no food means waste is not an option.

That night, we did not feed the fire. This was probably due to not wanting to leave our shelters! That morning, I found out later that the rules had been broken. Someone other than myself had tried to use a regular lighter to start the morning fire. To his dismay, the freezing temps in the morning prevented the lighter from working. This wasted valuable time while his hands were not in gloves. Denny showed us that ferro rods worked in any temperature. Later, fire would become more difficult and challenging as we learned how to do bow and drill fires. After we ate breakfast, we learned to set some snares for rabbits and other small animals that we might eat. These were simple spring snares created by bending small saplings over and cutting notches to hold them in place. A wire loop was made and attached to the sapling. The idea is that the loop would be placed in path of a rabbit. “Props” can be used to corral the animal into using that path. Walking through the loop would spring the trap, and hopefully the trap would not throw the prey into the woods! We didn't end up catching

anything the whole weekend, so I am glad we brought food in with us.

One more trick comes to mind that might help you know when the sun might go down, leaving you very cold if not by the fire. We learned how to fashion a sun dial with sticks in the snow. Start with one stick in the center. This will cast the moving shadow. When the sun comes up, you put a stick where the shadow is cast. Place a stick under the shadow each hour until the sun goes down. This will give you a good estimate of when darkness will fall, letting you finish any tasks that might need to be done for the day. This way, you can be by the fire instead of out hunting or trying to gather wood.

The last night was by far the coldest of the whole weekend! After returning to civilization, we found out that it had hit 20 below zero! Even though I was in a sleeping bag it was satisfying to know that I had spent the night in a natural shelter with no heat source.

I finally got to go winter camping with Denny and learn what he learned twenty-five years ago. I also found out he learned from a survival class in college of all places! They didn't offer anything like that when I was going to college. So if you are caught in the woods on a hunting trip or some other disaster in the winter, conservation and clear

thinking might help you make it through the night. I hope this guide can also help some people out by passing on what I have learned and used. I go winter camping every year now to continue my learning.



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DON'T FREEZE YOUR ASSETS OFF

A Closer Look at Cold Weather Clothing

By Kevin Kinney

Why do we get cold?

- **Convection-** Cold air replaces the warm air next to your skin. You lose.
- **Conduction-** Cold surfaces rob heat through direct contact with your skin. You lose again.
- **Radiation-** Heat leaves your body as infrared energy. You lose, but don't realize it.
- **Evaporation-** Water consumes energy when it turns from liquid to vapor. This can happen even in the dead of winter. The same holds true whether you're sweating or wearing pants that are soaked from melting snow. As moisture leaves the protective envelope of your clothes, it takes your body heat with it. Guess what...

Dress for the C.O.L.D.

- **Clean** your clothes. Dirt and body oils reduce the effectiveness of insulation by matting fibers together and retaining moisture.
- **Oversized** clothing traps more warm air within its fibers and won't restrict the circulation of blood.
- **Layer** your clothing. Adding or removing different pieces allows you to tailor your protective coverings to the environment. Wearing a single, thick garment does not.
- **Dry** clothes, from both the weather and perspiration. Synthetics, wool, silk, and other blends do not retain excessive moisture from perspiration like cotton will. It's important to keep your skin dry, and allow for water to exit your clothing so it will not draw heat from your skin.



A good system to follow:

- **Next to your skin,** wear a thin, loosely fitted layer that will draw perspiration and allow the heat from your body to push it away. Avoid cotton and other fibers that take a long time to dry when they're wet. Look for synthetic fibers like polypropylene, polyester, or natural fibers like wool or silk.
- **Insulation** does the work of retaining air that is warmed by your skin. Loose fitting layers with bulky fibers are perfect for trapping small pockets of warm air. Keep in mind that your perspiration will be passing through this layer, so these garments should remain warm when wet, and dry quickly. Polyester fleece, high loft synthetic filament batting, wool sweaters, and acrylic pile are excellent choices. Avoid cotton, which may be warm at first, but soaks up plenty of heat-robbing sweat.
- **Shell Layers** must act as a barrier to the environment. Wind, cold air, and precipitation will affect your insulation layers and make you cold. At the same time, perspiration must be allowed to escape to the outside. There are hundreds of shells to choose from, but a few very simple guidelines to follow:
 - Find a garment that's roomy enough to hold a few layers underneath without constricting your movement. Big pockets and a hood are nice.
 - Consider the climate your shell will be used in. In rainy weather you'll need a guarantee of water proofing. In colder areas, a simple windproof shell will allow perspiration to exit while retaining the effectiveness of your insulation.
 - Zippers and other mechanical vents allow you to tailor the amount of coverage you need without having to remove whole layers.

Know your vowels: A, E, I, O, U, and Y.

- **Anticipate**- add or remove layers *before* your skin temperature changes. This helps you avoid unnecessary perspiration or getting chilled when you rest. Shed an outer shell or layer of insulation before you begin any strenuous activities. Put your jacket back on as soon as you finish working. Once you're uncomfortable, it's costly to recover.
- **Extremities**- Your head, hands, and feet are your most vulnerable areas. Keep them covered and cozy. Wear a hat, even if it's only a thin one. A balaclava protects the delicate skin of your neck, ears, and face. Wear mittens instead of gloves in cold weather. Gloves have more surface area to rob heat from your lonely fingers. Cold feet can be dangerous, especially since they take considerable effort to reheat. Invest in a pair of durable pac boots or mukluks. Regular foot wear simply doesn't insulate you from the cold.
- **Inventory**- Bring extra layers of clothing and accessories. You may get wet, dirty, or damage something during your endeavors. Have an extra hat or three handy for different weather conditions. Bring extra mitten liners or thin gloves so you can perform dexterous tasks without contacting cold surfaces. If your insulation layers aren't dry, change them for new ones. Bring extra socks and an extra set of boot liners to keep your feet warm and dry.
- **Organize** your clothes so you won't lose time or temperature. Keep dry clothing accessible, and arrange some way to remove the moisture from your used items, i.e. – hanging them near the fire, laid on the hood of the car, inside your parka, etc.
- **Understand** your body's signals to recognize the onset of hypothermia. Even if you're used to having chilly hands or feet for short periods, you're fighting a losing battle with the laws of nature. As you get colder, your ability to react and recover drops at an alarming rate. React quickly, add a layer, notify someone else, and seek shelter.
- **Your body is a furnace** that heats your microclimate. Without the proper internal conditions you may never stay warm. Cold has tremendous effect on our systems as a whole, but it is possible to train your metabolism to produce plenty of heat.

Keeping your furnace stoked.

- **Hydrate**. You need water for every cell of your body. You may not feel thirsty because of the cold weather, but you should drink at regular intervals to stave off dehydration. Keep water handy inside your parka, or in an insulated container. If you're going to store water for any period of time, place the container upside down so ice will not form on the opening.
- **Eat**. Calories are a blessing. Food produces heat when you digest it. Instead of eating large meals, switch to a parka pocket buffet of candy, nuts, and rich snacks. When you consume small quantities all day long your metabolism adjusts to provide a constant stream of energy and body heat. Fat and protein will provide more sustained fuel, but mix in plenty of carbohydrates as kindling. You'll never go wrong with a 10 pound bag of trail mix. Drop a stick of butter in your coffee too.
- **Move**. Movement burns extra calories. Stay active to stay warm. Chopping wood, shoveling snow, or working with dogs are all good ways to boost your output.
- **Potty**. Don't skimp on the snowbank breaks. A full bladder or bowels are uncomfortable, and they sap heat from the rest of your innards.
- **Rest**. When you're simply too tired to continue, you need to recover. Find a sheltered spot and cover up quickly. If you've got a chance to sleep, add an extra blanket or two to ensure your comfort and safety.

OK. Now that we've covered the boring basics, let's get to the truth of it.

The \$65K question- *"What should I wear?"*

The cop-out answer: *"Well, that depends. Winter is a relative term."*

And now the qualifier. I kinda know about clothing. I've been making it for decades: long enough to learn the absolute rule and the fuzzy ones. Here are two certainties that each of us understands at the genetic level:

- Cold wins, eventually. Without shelter, food, water, and rest you're gonna get hypothermic.
- Warm and dry must be mutually inclusive. One without the other just hastens victory for the ice.

Proper clothing buys you a bit of time, that's all. "Proper?" you chuckle. "Is this the part where you tell us how your brand works better than" Nope. Winter clothing isn't that simple. Winter is a relative term, after all. **Where** is your winter? Are you pining in Truckee, chipping ice in Tennessee, or skinning a Moose in Ontario? Contrary to what you might think, misery does not always increase relative to latitude.



By my estimation, January sucks the most from Arkansas to Virginia. Why? Answer this: If you take both a loaded 2.75" stainless Ruger Security Six and a 1 quart water bottle from your kitchen table and put them inside your coat, which one will reach body temperature first while you're bumming? Assuming my math on the wheel gun is correct, the steel, lead, wood/rubber, and components of the ammunition will warm up long before the flask containing its weight in water. Water is evil. No other substance is quite so good at bringing you to ambient temperatures. Winter below the uppermost tier of the country and east of the mountains is an exercise in staying dry. The air is damp, the ground is damp, and the snow is damp. That's a penetrating combination. Now shovel your way to the carport and chip the ice from your windshield, and you're wet too. Joy! You folks are definitely tougher than me, and that's coming from a guy who looks south towards Minneapolis.

I've got it easy in January. Minnesota cold is dry and absolute. Not Canada dry, but still good enough. Cold air sucks, literally. We lose several inches from Lake Superior every winter to sublimation. The water molecules are snorked right into vapor by the cold air. ***Poof*** In that type of air mass, creative layering keeps me warm and dry as long as my calories hold out. I need only worry about ejecting water from my skin and lungs. Once it's clear, my insulation layers work really, really well.

What is that insulation? What shell works best? Aha! Let the debate begin. Some swear by their natural fibers, some at them. I'll stop short of drawing the line. At my age, I've learned that I might be wrong. I think there is no correct answer, only a paradox that you must work through. I love my work with wool, canvas, and leather for a host of reasons, from their longevity to their simple aesthetic- I am in the Moose Belt, after all. But I've also bivouacked at 12,500', played freeway with chunks of ice on class 4 whitewater, and ridden a double century. I dig synthetics for what they have to offer. Put simply, long chain polymers leveled the playing field so that we can all expect reasonable protection from the elements at a good price.

How do you choose? Here's the rub. Got a 30 minute bike commute in Chicago? Hit the R.E.I. and load up. You'll need the performance and washability of their laminates and fleece. Are you on a 30 day Caribou survey in Manitoba? You might prefer a nice Mackinaw. To understand both scenarios, let's look at how these contrary textiles deal with water and organic contaminants. Polyester, the go-to fiber for insulation, is plastic- period.

It rose to prominence because it does what wool won't. Polyester ignores water. Got it wet? Shake it off. Voila. Plastic avoids moisture so well that most next to skin layers perform simply by letting your body heat push perspiration right past them. The same holds true for fleece, pile, and high loft filaments. That's fine to a point. Stay active and you keep producing the heat that drives sweat away. But cool down, and the magic stops. The farther the sweat must travel, the more likely that it will stop and rest. Sure, the fibers are ready to release it, but why would they? One very famous polar explorer reported that their sleeping bags weighed almost 80 pounds by the time they reached their destination.

Even after a short journey through a single fleece, perspiration bounces right up against your shell. Is it coated? Laminated? Treated with a serious DWR? Those are all fine at keeping rain out, but they do an equally good job at keeping sweat in. Water molecules must navigate through small pores, or be absorbed directly into a monolithic membrane, then keep on trucking through to the other side. What happens if they get there and the outer surface is soaked? Well, at least they're out. There may be a traffic jam behind them. In the short run (ie; the bicycle commute) this works fine. Now don't read me wrong on this. The off the shelf performance for synthetics is unmatched. I've passed more petroleum under my needles than I've put in my car. I still run, bike, ski, and paddle. Rarely am I clad in clunky wool and canvas for those activities when there are so many sports car textiles to choose from. Just dry off your gear after your workout, and wash it now and then. Washing is easy after all. Things

Polypropylene underwear was lauded as the savior for active athletes. But it has a darker and stinkier side too, because synthetics don't know what to do with organic contaminants like body oils and dirt. Armpits, butts, hairy backs....Ewww. Body oils hit the fibers and kinda latch on. Then all those little bacteria hunker down and enjoy the warm, moist microclimate you've produced for them. Read a few ads in a sporting magazine and you'll see all the strategies we've employed to help water and gunk move on. We've spun silver fibers into the fabric, bred antibacterial chemical into their matrix, then scraped, scoured, scratched, twisted, twirled, and even electrically charged the yarns in an effort to give them more surface area to pull moisture along and kill the bugs. We've even mixed them with wool.

What was that? Wool? Weird, huh? Now we're using that very fiber that we tried to best because it held too much water-30% of its own weight in fact. You would think that sheep would drown in a single wet season. Why don't the Border Collies have to wring the flock out after the rain? (Well, mine would pee himself if he saw a sheep.) Because wool loves water, and knows what to do with it. Those hollow, kinky, scaly fibers are adept at actively transporting moisture away. Not all of it. A good deal remains inside the fibers themselves, where it warms up to body temperature. Think of it like a very slow thermostat. Sure it might take a bit to warm it up, but it's there when you need a thermal mass. Not only that, but the Keratin proteins in the hairs spend their days whacking bacteria. This fiber moves with the speed and durability of a truck.

Sounds like the kind of flinty clothing that would thrive in slightly damp conditions at a slow to moderate pace, without washing. Anyone hear bagpipes? Little did you know that Scotch was the first energy drink.

At this point in our outdoor history, clothing designers, textile engineers, and marketing wizards have driven both types of fibers off a cliff. We've got poly that looks and feels like fuzzy sheep, and slick looking Merino racing skin suits. Good luck telling who's who at a distance. If you're confused, then you're equally enlightened. But if there's steam coming from your ears, find the nearest door frame and start pounding your head. The simple truth is that winter is relative, so your clothing must be as well. We're blessed with 24 different seasons here in my neighborhood. We pride ourselves on 60 degree days in June and 40 below in January, but I own more outerwear than street clothes because 6-8 of those seasons are miserable and wet. My personal canvas and wool rock for 4-6 of the others. The remaining months are a crap shoot. If you're not already the expert in your portion of the globe, you're left with a simple choice: tinker with your layers and see what your thermostat reads, or stay inside.

We could ramble on for days about this. What about shell fabric coatings? Dirt? Cooking oils? Sparks? Colors? What's a bushcrafter to do? I have only 3 thoughts in closing. #1. Trust the military, for they have done the math. Surplus gear is the bargain of bargains. Find a country that matches your climate, and see how they do it. #2. Make your own. That's right- the guy in the garage encourages you to do the nasty. You're likely to get it

right, and guaranteed to enjoy the process. #3. Ask around. You're in the best company at BCUSA. We try not to kill each other off with bad advice because that cuts down on the bartering and the meets.

Happy Winter!



Woodsy child turned rabid designer and self proclaimed exile from the mainstream outdoor industry, Kevin Kinney runs Empire Canvas Works from his neighborhood garage in quiet Duluth, MN.

www.empirecanvasworks.com

Childhood Bushcraft

By Randy Haskins "ironridger"

I was taking a break at work the other day when I started thinking back on 35 years of paying the bills when it popped into the old grey cells: I was bushcrafting back in 1967 but was too young to realize it. Then again, a lot of us were probably in the same boat back then, if you were lucky enough to grow up in a country atmosphere. Building lean-tos, setting snares, and trying to build traps were just a part of our daily routine of fun. We ran out of the house as early as we were allowed with hatchet attached to belt and BB gun in hand, shouting back at Mom that we were heading to the woods. She would not know when we would be seen again until we finally returned hours later wet, muddy, and hungry. And, I might add, with both eyes and all of our digits still intact.

Well, except for one time when I had a grey squirrel in my sights that was clinging to the side of an old barn attached to my parents' property. I squeezed the trigger and...nothing. So in the heat of the battle, I hurriedly grabbed the end of the barrel that you had to twist to open the hole and pore in the BBs and POP! One shiny brass regulation-sized BB embedded into the palm of my hand. Try explaining that one to your dad.

For some of us now who are a birthday or two away from receiving our morning coffee discount at McDonald's, we may be trying to rekindle some of those younger days spent out in the bush. When we mention to our wives that we're headed to the woods for the day to try and start a fire by rubbing some sticks together and hang out in our

hammock, they come back with a glance that says maybe she should have taken a second look at that retirement home flyer she got in the mail.

Yet today in a lot of circles, this type of daily activity for an adolescent would surely be construed as some type of child endangerment. I definitely don't feel I was ever abused or neglected. Going out on those types of adventures was something I looked forward to every summer day. I can't help but think our kids and grandkids would benefit greatly from being allowed to create their own memories of childhood bushcrafting.

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